

REC'D 08 NOV 2004

WIPO

PCT

PCT/1804/3329

PA 1238719

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

October 22, 2004

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE UNDER 35 USC 111.

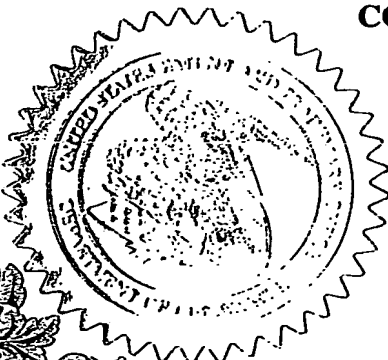
APPLICATION NUMBER: 10/684,877

FILING DATE: *October 13, 2003*

PRIORITY DOCUMENT


SUBMITTED OR TRANSMITTED IN
COMPLIANCE WITH RULE 17.1(a) OR (b)

By Authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS



N. Woodson
N. WOODSON
Certifying Officer

UTILITY PATENT APPLICATION TRANSMITTAL

Address to: Mail Stop PATENT APPLICATION Commissioner for Patents U.S. Patent & Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	Attorney Docket No. CMB 0101 PUS	22387 U.S. PTO 10/684877 
	Inventor(s) or Appln. Identifier Michael Beri	

1. This application entitled Brake Shoe and Brake Lining Blocks with Keyed Connection is:
- a. ☒ A new application under 37 C.F.R. § 1.53(b).
- b. ☐ A ☐ continuation ☐ divisional or ☐ continuation-in-part application under 37 C.F.R. § 1.53(b) of prior application Serial No. / filed on , entitled .
- c. ☐ A new utility application which claims the benefit of provisional application Serial No. , filed on .

Application elements and other attached papers:

2. ☒ Specification (including Claims and Abstract) [Total Pages 14]
3. ☒ Drawings (☐ informal / ☒ formal) [Total Sheets 2]
4. ☒ Oath or Declaration
- a. ☒ Newly-executed
- b. ☐ Copy from a prior application (37 C.F.R. § 1.63(d))
5. ☐ Incorporation By Reference: The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Item 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.
6. ☐ This application is filed by fewer than all the inventors named in the prior application, 37 C.F.R. § 1.53(d)(4).
- a. ☐ **DELETE** the following inventor(s) named in the prior nonprovisional application:
- b. ☐ The inventor(s) to be deleted are set forth on a separate sheet attached hereto.

CERTIFICATION UNDER 37 C.F.R. § 1.10

I hereby certify that this **UTILITY PATENT APPLICATION TRANSMITTAL** and the documents referred to as attached therein are being deposited on the below date with the United States Postal Service in an envelope as "Express Mail Post Office Addressee" addressed to: Mail Stop Patent Application, Commissioner for Patents, U.S. Patent & Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450 on:

Express
 Mail Label No. EV 141 487 470 US

Date of Deposit: October 13, 2003

Angelika Phillips
 (Type or print name of person mailing paper)

Angelika Phillips
 (Signature of person mailing paper)

7. Preliminary Amendment:

- a. ☐ A Preliminary Amendment Under 37 C.F.R. § 1.115 is attached.
- b. ☐ Cancel in this application original claims _____ of the prior application before calculating the filing fee.
- c. ☐ Please amend the specification by inserting before the first line the following sentence:
- "This is a _____ continuation _____ divisional of copending application(s) serial number _____ / _____ filed on _____."
- d. ☐ A Petition to Suspend Prosecution For The Time Necessary to File An Amendment (New Application Filed Concurrently) is attached.

8. Small entity status:

- a. ☒ Applicant claims small entity status.
- b. ☐ Small entity status was claimed in the prior nonprovisional application and such status is still proper and desired.
- c. ☐ Is no longer desired.

9. Fee Calculation:

FOR	NUMBER FILED	NUMBER EXTRA	RATE	CALCULATIONS
TOTAL CLAIMS (37 C.F.R. § 1.16(c))	20 -20 =	—	x 18.00	—
INDEPENDENT CLAIMS (37 C.F.R. § 1.16(b))	3 -3 =	—	x 86.00	—
MULTIPLE DEPENDENT CLAIMS (if applicable) (37 C.F.R. §1.16(d))			290.00	—
BASIC FEE (37 C.F.R. § 1.16(a))				770.00
TOTAL OF ABOVE CALCULATIONS				770.00
REDUCTION BY 50% FOR FILING BY SMALL ENTITY (NOTE 37 C.F.R. §§ 1.9, 1.27, 1.28)				385.00
\$40.00 ASSIGNMENT RECORDAL FEE (if applicable)				40.00
TOTAL				425.00

10. ☐ A check in the amount of \$_____ is enclosed.
11. ☒ The Commissioner is hereby authorized to credit overpayments or charge the following fees (or any deficiency therein) to Deposit Account No. 02-3978 :
- a. ☒ Fees required under 37 C.F.R. § 1.16.
- b. ☒ Fees required under 37 C.F.R. § 1.17.
12. Maintenance of Copendency of Prior Application

☐ A request for extension of time and the appropriate fee have been filed in the pending prior application (or are being filed in the prior application concurrently herewith) to extend the period for response until _____.

13. ☐ An Information Disclosure Statement (IDS) is attached, along with the following indicated attachments thereto:
- a. ☐ Form PTO/SB/08 (☐ sheet(s))
- b. ☐ Copies of references cited
14. ☐ Certified copy of priority document(s) AND ☐ English Translation Document (if applicable)
15. ☐ Nonpublication Request Under 37 C.F.R. § 1.213(a)
16. ☐ Request for Early Publication Under 37 C.F.R. § 1.219
17. ☒ Return Receipt Postcard
18. ☐ Other: _____
19. ☒ An Assignment of the invention to C.M. Brake Inc.
having an address of 21 Milvan Drive, Toronto Ontario, Canada M9L 1Y8
- a. ☒ is attached.
- b. ☐ was recorded on _____ at Reel _____, Frame _____.
- c. ☒ Applicant requests that the above assignee information be published with the application.
20. The power of attorney in the prior application is to:

Name of Attorney of Record

Reg. No.

☐ The power appears in the original papers in the prior application.

☐ The power does not appear in the original papers, but was filed on _____.

☐ A new power has been executed and is attached.

21. Correspondence Address: Please address all future communications to:

CUSTOMER NO.

22045

Telephone: 248-358-4400; Fax: 248-358-3351

Respectfully submitted,

Michael Beri

Date October 13, 2003



Name: Kevin J. Heintz
Registration No.: 29,805

☒ Attorney or agent of record
☐ Filed under Rule 34(a)

BRAKE SHOE AND BRAKE LINING BLOCKS WITH KEYED CONNECTION

BACKGROUND OF THE INVENTION

1. Field of the Invention

5 The present invention relates to drum brake shoes and brake lining blocks for vehicles such as trucks or buses.

2. Background Art

 Vehicle brakes are generally either disk brakes or drum brakes. Drum brakes are generally preferred for buses and commercial trucks because drum
10 brakes may provide a greater surface area of friction material. The braking surface of the friction material is generally riveted to a backing plate of a brake block. Generally, 12 to 16 rivets are required to attach a brake block to a brake shoe due to the substantial shear forces that must be withstood during braking between the brake blocks and the brake shoe.

15 Commercial and industrial vehicle brake linings that are riveted to steel brake shoes are generally rigid, non-asbestos friction material. If the outer diameter of the brake shoe surface that is to be retrofit with new brake linings is not completely flat or within original design radius tolerances, the lining after fastening to the shoe may crack or break off of the brake shoe. This may create problems
20 relating to braking performance and durability.

 The friction material used on brake blocks is drilled and countersunk to receive rivets that are used to connect the brake block to the brake shoe. Holes are formed in the friction material by either a drilling or a punch operation. If the counter bore is not drilled deep enough, the brake block may crack when riveted to
25 the to the brake shoe by a riveter. If the counter bore is drilled too deep, the brake

block may be only loosely fastened that can lead to cracking of the friction material or other problems.

5 If the rivet tool misses a rivet location and contacts the friction material, may harm the friction material. The friction material may be cracked, broken, or deformed if the rivet is misdirected, or improperly set-up for depth and force. Any cracking, breakage or deformation could adversely impact braking performance of the lined brake shoe when installed on a vehicle.

10 Substantial labor costs are incurred to rivet brake blocks to a brake shoe. Additional expenses may be incurred if it is necessary to scrap a cracked brake block.

15 The surface area of the friction material is reduced by each access hole in the friction material required for a rivet. Any reduction in surface area of the friction material may adversely affect stopping performance. Holes for rivets in the surface of the friction material may result in unwanted noise especially if dirt or other foreign material is permitted to collect in the rivet access holes.

It has been proposed to integrally mold rivets into the backing plate of the brake block. Another attaching mechanism proposed for brake blocks is the use of clinch nuts, however, clinch nuts are generally only usable with transit bus brakes due to the high profile of the clinch nuts.

20 In the manufacture of brake blocks, problems may be encountered including blistering at the corners of the brake blocks. The corners of brake blocks may be broken or damaged especially if the corners are formed with right angle corners.

25 There is a need for an improved brake shoe having brake blocks that maximize the friction material surface area while minimizing riveting operations. There is also a need to eliminate the potential for damage to friction material on

brake blocks when they are assembled to a brake shoe. Applicant's invention is directed to solving the above problems as summarized below.

SUMMARY OF THE INVENTION

According to one aspect of the present invention, a brake shoe assembly is provided that includes a brake shoe and a brake plate. The brake shoe has an outer radial surface. The brake plate is secured to the outer radial surface of the brake shoe. A slot and an integrally formed key are provided between the brake shoe and brake plate. The slot and key prevent radial movement of the brake plate relative to the outer radial surface of the brake shoe. The slot and key also greatly increase resistance to shear forces when the brake is applied when compared to conventional rivet secured brake linings. A plurality of rivets are provided for securing the brake plate to the brake shoe.

According to another aspect of the present invention, a vehicle brake drum shoe assembly is provided that includes a cylindrical brake shoe and at least one brake plate that is secured to the outer radial surface of the brake shoe. A pair of keys are integrally formed by a punching operation in each of the cylindrical brake shoes to extend outwardly from the outer radial surface of the brake shoe. The brake plate is secured to the outer surface of the brake shoe and includes a pair of slots for receiving the keys of the brake shoe. The keys of the brake shoe are received in the slots in the brake plate and function to limit, and prevent, radial movement of the brake plate relative to the outer radial surface of the brake shoe.

Other aspects of the invention relate to preassembling rivets to the brake plate and providing a pair of alignment holes for receiving the preassembled rivets that facilitate alignment of the brake shoe keys with brake plate slots. The preassembled rivets are longer than the height of the brake shoe key to align the brake shoe key with the brake plate slot. The preassembled rivets are secured to the brake shoe by a flaring tool. The friction material of the brake lining is molded over and covers one end of the preassembled rivets. One brake shoe may receive two brake blocks that each have two slots or key ways, wherein four keys are

formed on each brake shoe. The keys are formed or pressed out from the inside of the outer surface of the brake shoe without breaking through the brake shoe. The elongated keys, or ribs, fit tightly within the elongated key ways formed in the backing plates.

5 According to other aspects of the invention relates to forming four recesses at the four corners of the brake plate that expose a corner portion of the brake plate. Rivets are inserted through the four exposed corner portions to join the brake plate and brake shoe after the preassembled rivets align the brake shoe key with the brake plate slot. The brake plate may then be riveted to the brake shoe for
10 providing metal-to-metal contact and eliminating the need to rivet through the friction material. The brake plate slot is axially elongated to receive the elongated brake shoe keys. The backing plates span the friction lining surface and provide additional strength for the brake linings as they are attached to the brake shoe.

 According to another aspect of the present invention, a method of
15 manufacturing a brake assembly is provided. The method begins by providing a brake plate having a plurality of rivet apertures and an alignment slot. Four apertures may be provided at four corners of the brake plate with two intermediate apertures being provided at opposite sides of the brake plate. A set of preassembled rivets are inserted into the two intermediate apertures of the brake plate. A
20 frictional brake lining is then molded over the preassembled rivets so that the frictional brake lining covers the preassembled rivets. A brake shoe having a plurality of apertures that match the apertures in the brake plate also further includes a key that protrudes from the outer radial surface of the brake shoe. Each of the brake plate slots receives a brake shoe key when the brake plate is mated to the
25 brake shoe. The preassembled rivets are aligned with corresponding holes in the brake shoe to facilitate inserting the brake shoe key into the brake plate slot. A set of rivets is inserted in each of the rivet apertures in the corners of the brake plate. The rivets extend through corresponding holes in both the brake plate and the brake shoe and are secured by a rivet tool in a riveting operation. The preassembled rivets
30 are flared to secure the brake plate to the brake shoe. The brake shoe key when

inserted in the brake plate slot limits, or prevents, movement of the brake plate relative to the outer radial surface of the brake shoe.

According to other aspects of the invention as they relate to the method of manufacturing a brake assembly, the molding step may be performed without applying a brake lining over portions of the four corners of the brake plate. The open corners of the brake plate expose the four corner rivet apertures to facilitate riveting the brake plate to the brake shoe with metal-to-metal contact. This allows the riveting process to be used without drilling and counterboring the friction material for riveting access. The method may also comprise forming the brake slot as an axially elongated aperture and forming the brake shoe key as an axially elongated key, or rib, that fits within the axially elongated brake slot. The method may further comprise forming a pair of axially elongated slots in the brake plate and forming a corresponding pair of axially elongated keys in the brake shoe for each brake plate. The keys may be formed as integrally formed portions of the brake shoe in a punching or stamping operation.

These and other aspects of the present invention will be better understood in view of the attached drawings and following detailed description of the illustrated embodiment.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is an exploded perspective view of a brake shoe with one brake plate secured to the brake shoe and a second brake plate shown prior to assembly to the brake shoe;

FIGURE 2 is an elevation view of a brake shoe and two brake plates;

FIGURE 3 is a cross-section taken along the line 3-3 in Figure 2;

FIGURE 4 is a cross-section taken along the line 4-4 in Figure 2;

FIGURE 5 is a cross-sectional view of a preassembled rivet in a brake plate inserted through a hole in the brake shoe; and

FIGURE 6 is a cross-sectional view similar to Figure 4 showing the preassembled rivet flared to secure the brake plate to the brake shoe.

5 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

Referring to Figure 1, a brake shoe 10 having a cylindrical outer surface 12 is illustrated with one brake plate 16 assembled to the cylindrical outer surface 12 and a second brake plate 16 that is shown unattached to the brake shoe 10. Each of the brake plates 16 includes a backing plate 18 to which is bonded a layer of friction material 20. A plurality of apertures 14 are provided in the backing plate 18 into which friction material 20 is integrally molded to mechanically attach the friction material 20 to the backing plate 18.

The brake plates 16 are attached, in part, by rivets 22 that are secured to the backing plate 18 at open corners 24. The open corners 24 are areas where no friction material 20 is bonded to the backing plate 18. Alternatively, the layer of friction material 20 could be applied over the entire backing plate 18 and then subsequently removed by cutting away or milling the friction material to create the open corners 24. Holes 26 for receiving the rivets 22 are formed in the brake shoe 10 at spaced locations corresponding to the spacing of the rivets 22. The brake plates 16 are riveted by the rivets 22 through holes 28 in the backing plate 18 directly to the outer surface 12 of the brake shoe 10 to create a rivet connection that has metal-to-metal contact.

Preassembled rivets 30 extend from each of the backing plates 18. The preassembled rivets 30 are received in holes 32 formed in the outer surface 12 of the brake shoe 10. The preassembled rivets 30 are secured to mounting holes 34, the backing plates 18 and a layer of friction material 20 is molded onto the backing plate 18 covering one end of the preassembled rivets 30. The rivets 22 and preassembled rivets 30 are arranged in rows, as shown, on the inboard side 36 and

outboard side 38 of the brake shoe 10. The preassembled rivets 30 are arcuately spaced from the rivets 22 that are inserted through holes 28 in the open corners 24 of the brake plate 16.

5 Keys 40 are formed in the brake shoe 10 to extend outwardly from the cylindrical outer surface 12. The keys 40 are preferably elongated in shape and extend lengthwise in an axial direction. Two keys 40 may be arranged, as shown, in axial alignment on the outer surface 12 of the brake shoe 10. The keys 40 are received in slots 42 formed in the backing plate 18 of the brake plates 16. The integrally formed keys 40 when received in the slots 42 provide a positive and
10 effective part of the attachment system that can withstand substantial shear forces that are created when the brake shoe engages a brake drum (not shown) to stop a vehicle (not shown).

Referring to Figure 2, the construction of the brake plates is shown in greater detail. Each brake plate 16 has a backing plate 18 onto which a layer of
15 friction material 20 is bonded. The open corners 24 of each brake plate 16 each reveal a part of the backing plate 18. A layer of friction material 20 is molded over the preassembled rivets 30 to provide a continuous layer of friction material 20 that is not interrupted by a plurality of riveting holes as was provided with conventional brake plates. The preassembled rivets 30, as illustrated, may be axially aligned with
20 the keys 40 and slots 42.

Referring to Figure 3, connection of the brake plates 16 to the brake shoe 10 by means of the rivets 22 and preassembled rivets 30 is shown. Rivets 22 are flared in a riveting operation after insertion through the rivet receiving holes 26 and holes 28 formed in backing plates 18. The preassembled rivets 30 are
25 assembled to the backing plate 18 before the layer of friction material 20 is applied to the backing plate 18. After the brake plate 16 is assembled to the brake shoe 10, a-flaring tool is used to flare the end of the preassembled rivets 30 forming a rivet-like connection between the brake plate 16 and brake shoe 10.

Referring to Figure 4, a cross section of the connection between the key 40 of the brake shoe 10 and slot 42 in the backing plate 18 of the brake plate 16 is shown. The key 40 may be formed by a sheet metal forming process wherein a punch engages the brake shoe 10 to force the key 40 to extend outwardly from the outer surface 12 of the brake shoe 10 without separating the key 40 from the brake shoe 10.

Referring to Figure 5, one of the preassembled rivets 30 is shown inserted into one of the alignment pin holes 32. The preassembled rivets 30 orient the slots 42 relative to the keys 40 and also align the rivet receiving holes 26 on the brake shoe 10 with the holes 28 formed in the open corners 24 of the backing plate 18. As shown in Figure 6, the alignment pin 30 has been flared by a flaring tool to firmly secure the backing plate 16 to the brake shoe 10.

The method of manufacturing the brake shoe 10 having replaceable brake plates 16 is described below. The method begins by providing a brake plate 16 having a plurality of apertures for receiving rivets and at least one slot 42 for receiving a key 40. Four rivet receiving apertures or holes are provided at the four corners of the backing plate 18 of the brake plate 16. Two preassembled rivets 30 are inserted into holes 32 in the backing plate 18 between the rivet receiving holes 26. A layer of friction material 20 is then molded over the preassembled rivets 30 so that the friction brake lining 20 covers the outer ends of the preassembled rivets 30. The brake shoe 10 has rivet holes 26 that are provided to receive rivets 22 and holes 32 for receiving the preassembled rivets 30. The brake plates 16 have slots 42 for receiving a brake shoe key 40 when the brake plate 16 is mated to the brake shoe 10. Preassembled rivets 30 are used to align the brake plate 16 with the brake shoe 10 and facilitate insertion of the brake shoe key 40 into the slots 42. Rivets 22 are inserted into each of the rivet apertures in the four open corners 24 of the brake plate 16. The rivets 22 extend through corresponding holes 26 and 28 in the brake shoe 10 and brake plate 16, respectively. The rivets 22 are riveted at the open corners 24 by a riveting tool. The preassembled rivets 30 are flared to secure the brake plate 16 to the brake shoe 10 at a point generally axially aligned with keys 40 and slots 42. The preassembled rivets 30 could alternatively be offset from the keys

40 and slots 42. The brake shoe key 40 is inserted in the slot 42 to prevent radial movement of the brake plate 16 relative to the outer radial surface 12 of the brake shoe 10.

5 The method of assembling brake plate 16 to a brake shoe 10 described above simplifies the manufacture of brake shoes by reducing the number of rivets required to secure the brake plate 16 to the brake shoe 10. It also eliminates boring and counter boring rivet holes in the friction material. Preassembled rivets 30 align the keys 40 with the slots 42 while at the same time aligning the holes 28 in the backing plate 18 with the rivet receiving holes 26 in the
10 brake shoe 10. Metal-to-metal contact is provided for the rivets 22 to secure the brake plate 16 to the brake shoe 10. The open corners 24 provide clearance between the rivet locations and the friction material 20 so that the riveting operation will not crack the layer of friction material 20.

15 While embodiments of the invention have been illustrated and described, it is not intended that these embodiments illustrate and describe all possible forms of the invention. Rather, the words used in the specification are words of description rather than limitation, and it is understood that various changes may be made without departing from the spirit and scope of the invention.

WHAT IS CLAIMED IS:

- 1 1. A brake shoe assembly comprising:
2 a brake shoe having an outer radial surface;
3 a brake plate secured to the outer radial surface of the brake shoe, the
4 brake plate having a back plate that supports a brake lining;
5 at least one slot and at least one integrally formed key provided on
6 either the brake shoe or the backing plate for resisting radial movement of the brake
7 plate relative to the outer radial surface of the brake shoe; and
8 a plurality of rivets for securing the brake plate to the brake shoe.
- 1 2. The brake shoe assembly of claim 1 further comprising a pair
2 of preassembled rivets pre-assembled with and extending away from the brake plate
3 toward the brake shoe, the brake shoe having a corresponding pair of holes to
4 receive the preassembled rivets, the preassembled rivets being inserted into the
5 holes to facilitate alignment of the key within the slot.
- 1 3. The brake shoe assembly of claim 2 wherein the preassembled
2 rivets are longer than the brake shoe key to facilitate aligning the key relative to the
3 slot prior to the slot receiving the key.
- 1 4. The brake shoe assembly of claim 2 wherein the preassembled
2 rivets are secured to the brake shoe by a flaring tool.
- 1 5. The brake shoe assembly of claim 2 wherein the plurality of
2 rivets are inserted into the brake plate and the brake shoe after the preassembled
3 rivets align the key with the slot.
- 1 6. The brake shoe assembly of claim 2 further comprising a
2 friction material brake lining molded over and covering the preassembled rivets.

1 7. The brake shoe assembly of claim 1 further comprising a
2 frictional brake lining molded on the brake plate, the brake lining including a cut out
3 exposing four corners of the brake plate, wherein each exposed corner of the brake
4 plate has a hole for receiving a rivet for riveting the brake plate to the brake shoe.

1 8. The brake shoe assembly of claim 1 wherein the slot is axially
2 elongated to receive a correspondingly elongated key.

1 9. The brake shoe assembly of claim 8 wherein the brake plate
2 includes a pair of axially elongated slots for receiving a corresponding pair of
3 axially elongated keys formed on the brake shoe.

1 10. The brake shoe assembly of claim 1 wherein the key is
2 integrally formed as part of the brake shoe.

1 11. A method for manufacturing a brake assembly, the method
2 comprising:
3 providing a brake plate having a plurality of rivet apertures and an
4 alignment slot, wherein four of the rivet apertures are corner rivet apertures
5 provided at four corners of the brake plate and two of the rivet apertures are
6 intermediate rivet apertures provided on opposite sides of the brake plate;
7 inserting a set of preassembled rivets into the two intermediate rivet
8 apertures of the brake plate;
9 molding a friction material brake lining over the set of preassembled
10 rivets, the friction material brake lining covering the set of preassembled rivets;
11 providing a brake shoe having a plurality of holes corresponding to
12 the location of the plurality of apertures of the brake plate, the brake shoe further
13 including a key protruding from an outer radial surface;
14 mating the brake plate slot with the brake shoe key by aligning the
15 preassembled rivets with corresponding holes in the brake shoe prior to the brake
16 plate slot receiving the brake shoe key;

17 inserting a rivet in each of the four rivet apertures at the corners of
18 the brake plates, the rivets extending through corresponding holes in the brake shoe
19 and apertures in the brake plate; and
20 securing the brake plate by fastening the rivets and the preassembled
21 rivets to the brake shoe with the brake plate slot receiving the brake shoe key to
22 resist radial movement of the brake plate relative to the outer radial surface of the
23 brake shoe.

1 12. The method of claim 11 wherein the molding step comprises
2 molding friction material brake lining on the brake plate while preventing
3 application of the brake lining over portions of the four corners of the brake plate,
4 wherein each corner of the brake plate includes one of the four corner rivet
5 apertures.

1 13. The method of claim 11 wherein providing the brake plate
2 comprises forming the brake slot as an axially elongated aperture and forming the
3 brake shoe key as an axially elongated rib to fit within the axially elongated brake
4 plate aperture.

1 14. The method of claim 13 further comprising forming a pair of
2 axially elongated slots in the brake plate and forming a corresponding pair of axially
3 elongated keys in the brake shoe.

1 15. The method of claim 11 wherein providing the brake shoe
2 comprises forming the brake shoe key as an integrally formed portion of the brake
3 shoe.

1 16. A vehicle drum brake shoe assembly comprising:
2 a cylindrical brake shoe having a pair of integrally formed keys
3 extending outwardly from an outer radial surface; and
4 a brake plate secured to the outer radial surface of the brake shoe, the
5 brake plate having a pair of slots to receive the pair of keys, the keys are received

6 in the slots for resisting radial movement of the brake plate relative to the outer
7 radial surface of the brake shoe.

1 17. The assembly of claim 16 further comprising a pair of
2 preassembled rivets secured to and extending away from the brake plate toward the
3 brake shoe, the brake shoe having a corresponding pair of holes to receive the
4 preassembled rivets, the preassembled rivets being inserted into the brake shoe holes
5 prior to mating of the slot and key to facilitate alignment of the brake shoe key with
6 the brake plate slot.

1 18. The brake shoe assembly of claim 17 further comprising a
2 frictional brake lining molded over and covering the preassembled rivets to secure
3 the preassembled rivets to the brake plate.

1 19. The brake shoe assembly of claim 18 wherein the brake plate
2 has four corners and wherein the brake lining does not cover the four corners of the
3 brake plate, each corner of the brake plate having a hole for receiving a rivet for
4 riveting the brake plate to the brake shoe.

1 20. The brake shoe assembly of claim 16 wherein the brake plate
2 slot is axially elongated to receive a correspondingly elongated brake shoe key.

ABSTRACT OF THE DISCLOSURE

5 A brake shoe assembly comprising a brake shoe to which brake plates are assembled. The brake shoe has a key that extends outwardly from an outer radial surface of the brake shoe. The key is received in a slot formed in a backing plate of the brake plate. Preassembled rivets are provided on the brake plates to facilitate alignment of the brake plates with the brake shoe so that the key is received in the slot. Rivets are provided in four open corner areas so that the brake plate may be secured to the brake shoe with metal-to-metal contact where the brake plate is riveted to the brake shoe.

DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY

Atty. Docket No. CMB 0101 PUS
First Named Inventor Michael Beri

As a below-named inventor, I hereby declare that my residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

BRAKE SHOE AND BRAKE LINING BLOCKS WITH KEYED CONNECTION.

the specification of which:

☒ is attached hereto; or
☐ was filed on (MM/DD/YYYY) _____ as U.S. Application Number or PCT International Application Number _____, and was amended on (MM/DD/YYYY) _____ (if applicable). (I hereby authorize my attorney to insert the application filing date and number when they become known.)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(s)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below, and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Priority Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? (Yes/No)

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below.

Application Number(s)	Filing Date (MM/DD/YYYY)

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code § 112. I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

Application Number(s)	Filing Date (MM/DD/YYYY)	Status: Patented, Pending, Abandoned

Declaration for Patent Application (cont'd.)

Atty. Docket No. CMB 0101 PUS

I hereby appoint the practitioners associated with Customer Number 22045 to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and direct that all correspondence be addressed to that Customer Number. Telephone calls should be directed to (248) 358-4400.

CUSTOMER NO.

22045

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of Sole or First Inventor Michael Beri

Inventor's signature *M Beri*

Date 9 OCT 2003

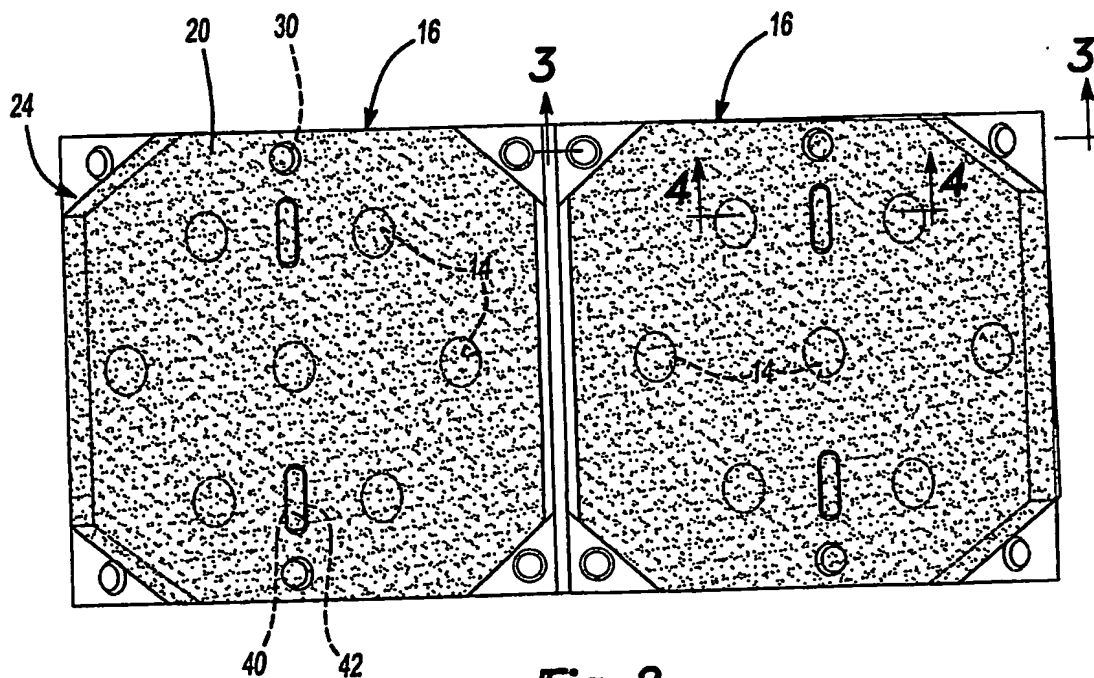
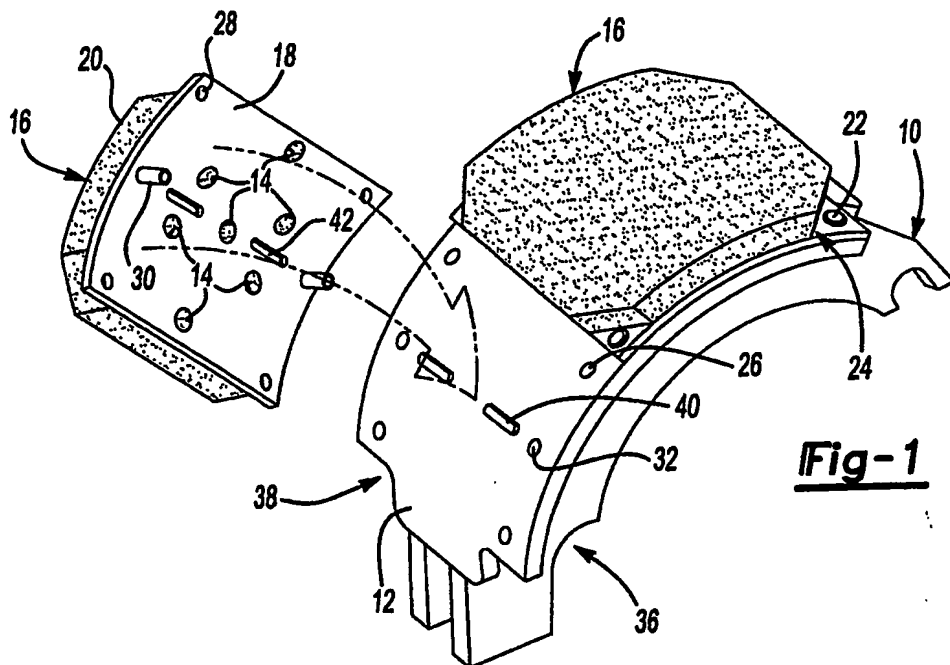
Mailing address 31 Codsell Avenue, North York, Ontario, Canada M3H 3V7

Residence (Same as above)

Citizenship Canadian

Title: **BRAKE SHOE AND BRAKE LINING BLOCKS WITH KEYED CONNECTION**
First Named Inventor: **Michael Beri**
Atty. Docket No.: **CMB 0101 PUS**

1/2



Title: BRAKE SHOE AND BRAKE LINING BLOCKS WITH KEYED CONNECTION

First Named Inventor: Michael Beri

Atty. Docket No.: CMB 0101 PUS

2/2

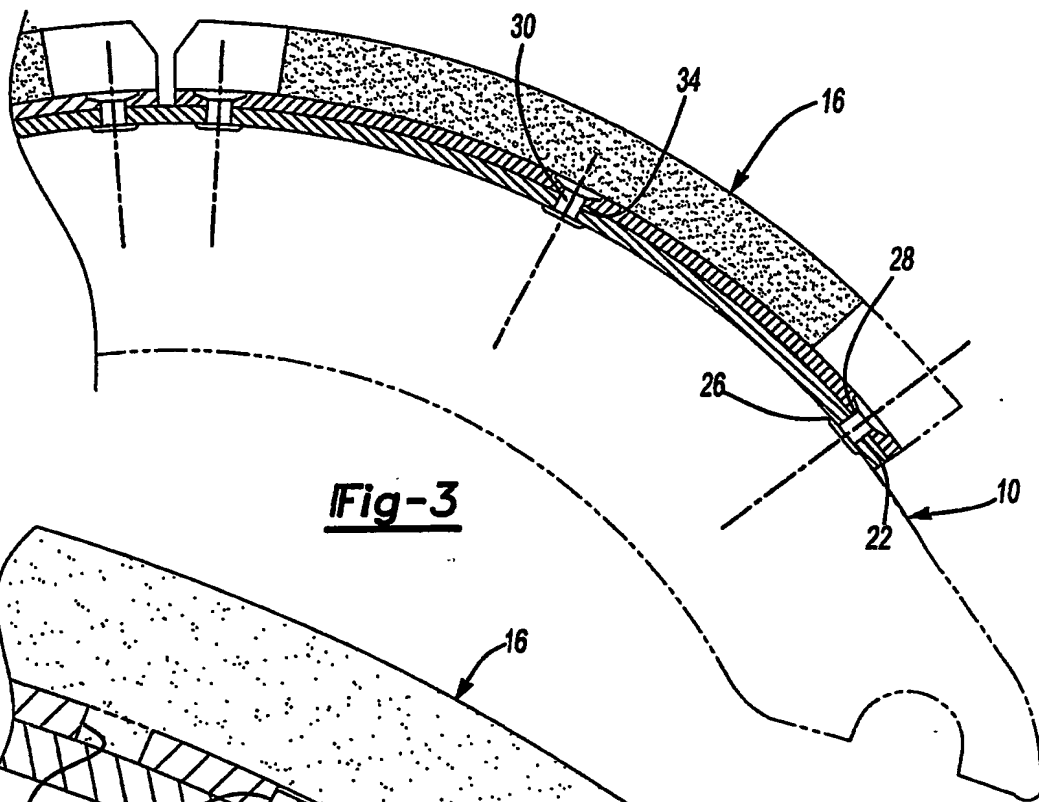


Fig-3

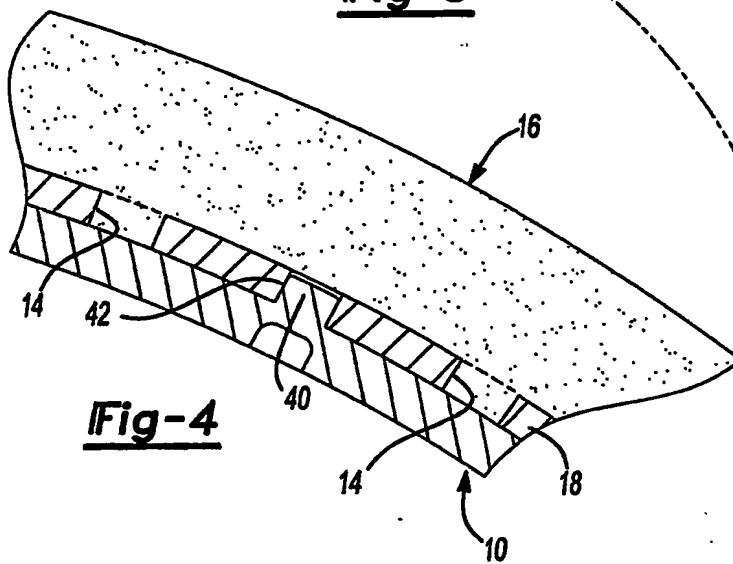


Fig-4

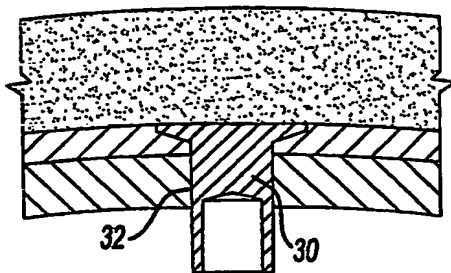


Fig-5

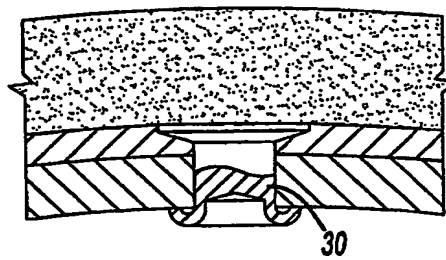


Fig-6